C. Remarks

The claims are 1-71. Claims 1-15 and 23-71 have been withdrawn from consideration as being directed to non-elected inventions. The claims at issue are 16-22, with claim 16 being the sole independent claim. Claim 21 has been amended to address section 112, second paragraph, issues. Claim 22 has been amended to reflect the changes in claim 21. No new matter has been added. Reconsideration of the present claims is expressly requested.

Claims 16-22 stand rejected under 35 U.S.C. § 112, second paragraph, as being allegedly indefinite.

With respect to the term "finely fractionalized polymer", Applicants again note that this term is clearly defined in paragraph [0074] on page 16 of the substitute specification.[1] "Finley fractionalized" polymer is a polymer cleaved by a catalyst for cleavage.

With respect to claim 21, Applicants have amended this claim to clarify that a "substance reactive on said functional group" is a substance, which is capable of reacting with a functional group of the first part. Applicants note that claim 21 is directed to a further modification of the surface. Accordingly, the above indefiniteness rejection should be withdrawn.

Claims 16 and 21 stand rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by U.S. Patent No. 5,958,988 (Matsushita). Claim 16 stands rejected under 35

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[1]/All recitations of page and paragraph numbers for the subject application in this paper refer to the substitute specification, which was filed on July 1, 2003 and entered by the Examiner.

U.S.C. § 102(e) as being allegedly anticipated by U.S. Patent No. 6,121,387 (Choudhery). Claims 17 stands rejected under 35 U.S.C. § 103(a) as being allegedly obvious from Matsushita or Choudhery. The grounds of rejection are respectfully traversed.

Prior to addressing the merits of rejection, Applicants would like again to review some of the key features and advantages of the presently claimed invention, which are essential to understanding the differences between the instant invention and the prior art. The present claimed invention is directed to an element, which has a part of its surface treated with a polymer compound. For example, an element with a hydrophobic surface may be treated with a polymer so that at least a part of the surface becomes hydrophilic. The polymer compound is obtained by bonding fractionalized polymers with each other after these polymers are finely fractionalized by a catalyst for polymer cleavage and re-oriented according to the surface energy of the material.

Conventionally, a surface treatment is conducted by, for instance, coating a surface with a polymer compound having the desired wettability characteristics. In order to achieve a uniform and strongly adhered coating, the polymer compound has to be uniformly oriented and bonded to the surface. However, since it is hard to achieve a requisite uniform orientation of the functional groups in a polymer with respect to the surface (particularly for polymers having long chains), both the adherence strength (particularly when the surface is uneven) and the uniformity of deposition in conventional treatment techniques are not adequate.

To overcome this problem, the polymer used to treat the surface in the present invention is cleaved to obtain finely fractionalized polymers, which can be more easily re-oriented with respect to the surface than their larger polymeric predecessors (see

paragraphs [0094] - [0100], [0111] - [0114] and Figs. 5-7 and 23). After cleavage, the smaller portions of the original polymeric compounds are re-oriented based on their energy compatibility with the substrate. This allows a uniform organization of portions of the polymer, which otherwise are randomly oriented. The random orientation prevents good adhesion to the surface and inhibits the intended surface modification.

After the finely fractionalized polymers have been re-oriented so that their second parts[2] are pointed toward the surface and the functional groups are pointed away from the surface, the finely fractionalized polymers are at least partially re-bonded, resulting in a uniformly oriented, strong coating on the surface of an element being treated.

The superiority of the treated surface according to the present invention is clearly demonstrated by, for example, Example 1 and Comparative Example 2. Specifically, in both Example 1 and Comparative Example 2 a hydrophobic surface of a container was treated with polyoxyalkylene-poly(dimethyl siloxane). While in Example 1 this polymer was first finely fractionalized, re-oriented and then re-bonded, the surface in Comparative Example 2 was merely coated with the above-mentioned polymer.[3] As a result, the coating in Example 1 was better adhered to the surface of the container than in Comparative Example 2 due to a more uniform orientation of the functional groups in the polymer, leading to a surface that had undergone a successful hydrophilic treatment. The coating in Comparative Example 2 failed to provide the surface of the container with

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[2/] Second parts have an interfacial energy (i) different from that of the functional groups that impart the treated surface with the desired characteristics; and (ii) approximately equal to the surface energy of the part of the surface being treated.

[3/]The coating composition in Comparative Example 2 does not contain sulfuric acid, which is used to cleave the polymer in Example 1.

hydrophilic characteristics comparable to those in Example 1 (see paragraphs [0128] - [0131]).

Matsushita is directed to a surface modification of a polyurethane using an activated group. This clearly is not a surface modification achieved by finely fractionalizing the polymer by a catalyst for cleavage and re-orienting the polymer so that it is aligned such that portions thereof with an interfacial energy (i) different from that of the functional groups that impart the treated surface with the desired characteristics; and (ii) approximately equal to the surface energy of the part of the surface being treated are pointed toward the surface. Re-orientation of the finely fractionalized polymer based on the surface energy of the material prior to re-polymerization is not taught or suggested by Matsushita. As shown by the above-mentioned Example 1 and Comparative Example 2, the modification of the surface by the cleaving and re-organizing the polymer leads to unexpectedly superior results. Accordingly, Matsushita cannot affect the patentability of the presently claimed invention.

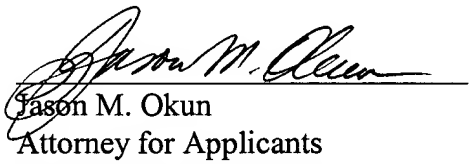
Choudhery cannot cure the deficiencies of Matsushita. Choudhery teaches conducting a surface modification by polymerizing a cleavable polymer and a multi-functional compound. However, like Matsushita, Choudhery does not disclose or suggest finely fractionalizing the polymer by a catalyst for cleavage and, prior to at least a partial re-polymerization, re-orienting the polymer so that it is aligned such that portions thereof with an interfacial energy (i) different from that of the functional groups that impart the treated surface with the desired characteristics; and (ii) approximately equal to the surface energy of the part of the surface being treated are pointed toward the surface. There is no teaching regarding the re-orientation, which leads to superior properties of the modified

surface. Accordingly, Choudhery, whether considered separately or in combination with Matsushita, cannot affect the patentability of the invention presently claimed.

Wherefore, it is respectfully requested that all outstanding rejections be withdrawn and that the present case be passed to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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